

AMENDMENTS TO THE CLAIMS

Claims 1-19 are cancelled. Claims 20-36 have been amended. New claims 37-53 have been entered. The Applicant requests reconsideration of the claims in view of the following amendments reflected in the listing of claims.

Listing of claims:

1. – 19. (Cancelled)

20. (Currently Amended) A system for processing signals, the system comprising:

~~An adaptive linear system to adapt a set of complex valued observations having adaptation parameters with complex valued elements, comprising:~~

~~a complex Least Square Solver (LESS), having:~~

~~means for transforming adaptation observations from a complex arithmetic to two sets of real number arithmetic observations by means of binary orthogonalization transformation (BOT);~~

~~means for computing with two real number LESS two sets of real number arithmetic adaptation parameters~~ by applying two real number Least Square Solvers (LESS) to said two sets of real number arithmetic observations; and

means for transforming₁ after said computing with LESS₁ said two sets of real adaptation parameters to a set of complex number arithmetic adaptation parameters using an inverse binary orthogonalization transform (IBOT), wherein said set of complex number arithmetic adaptation parameters are used as filter parameters for adaptive filtering of the signal.

21. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20~~, wherein said ~~means of computing of said two sets of~~two real number LESS are applied in parallel.

22. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20~~, wherein said ~~means of computing of said two sets of~~two real number LESS are applied in series.

23. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20~~, wherein ~~[[the]]~~said LESS ~~represents~~comprises a Recursive Least Squares algorithm (RLS).

24. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20~~, wherein ~~[[the]]~~said LESS ~~represents~~comprises a Least Mean Squares (LMS) algorithm.

25. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20~~, wherein said LESS is a Householder transformation.

26. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20~~, wherein said LESS is a Cholesky decomposition.

27. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20~~, wherein said LESS is QR Decomposition (QRD).

28. (Currently Amended) The system according to claim 23~~The adaptive linear system as described in claim 20~~, wherein ~~[[the]]~~said RLS is computed by a systolic array.

29. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20~~, wherein said LESS utilizes one or more~~of the LESS represents the group consisting of~~ a Block Matched Filter Estimator

(BMFE), a Block Zero Forcing Estimator (BZFE), and/or a Block Minimum Mean Square Error Estimator (BMMSEE).

30. (Currently Amended) The system according to claim 29~~The adaptive linear system as described in claim 20~~, wherein one or more of said BMFE, said BZFE, and/or said BMMSEE are computed via one or both of~~the group is computed through the group consisting of a Cholesky decomposition and/or a QR Decomposition (QRD).~~

31. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20~~, comprising means for constraining~~wherein said LESS is constrained as CLESS in that any~~ using~~initial BOT from complex number arithmetic to real number arithmetic is used;~~ means for applying~~then two real computation, Constrained Least Square Solver, (CLESS) are applied, wherein each one produces~~~~[[ing]]~~ P output streams; and means for implementing~~finally a corresponding number of P IBOT modules from real number arithmetic to complex number arithmetic are implemented.~~

32. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20~~, wherein said linearcomprising means for

performing one or more of ~~system is applied for the group consisting of~~ temporal, spatial, joint temporal and/or spatial channel estimation of the signal.

33. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20, wherein said linear system is applied for the group consisting of~~comprising means for performing one or more of temporal, spatial, joint temporal and/or spatial channel equalization.

34. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20, wherein said linear system is applied for~~comprising means for performing carrier frequency estimation.

35. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20, wherein said linear system is an adaptive filter.~~

36. (Currently Amended) The system according to claim 20~~The adaptive linear system as described in claim 20, wherein said adaptive linear system is selected from the group consisting of~~comprising means for performing one or more of channel estimation, system parameter estimation, channel equalization,

recursive updating of output parameters, non-recursive updating of output parameters, and/or system identification.

37. (New) A system for processing signals, the system comprising:

at least one processor for transforming adaptation observations from a complex arithmetic to two sets of real number arithmetic observations using binary orthogonalization transformation (BOT);

said at least one processor computes two sets of real number arithmetic adaptation parameters by applying two real number Least Square Solvers (LESS) to said two sets of real number arithmetic observations; and

said at least one processor transforms, after said computing with LESS, said two sets of real adaptation parameters to a set of complex number arithmetic adaptation parameters using an inverse binary orthogonalization transform (IBOT), wherein said set of complex number arithmetic adaptation parameters are used as filter parameters for adaptive filtering of the signal.

38. (New) The system according to claim 37, wherein said two real number LESS are applied in parallel.

39. (New) The system according to claim 37, wherein said two real number LESS are applied in series.

40. (New) The system according to claim 37, wherein said LESS comprises a Recursive Least Squares algorithm (RLS).

41. (New) The system according to claim 37, wherein said LESS comprises a Least Mean Squares (LMS) algorithm.

42. (New) The system according to claim 37, wherein said LESS is a Householder transformation.

43. (New) The system according to claim 37, wherein said LESS is a Cholesky decomposition.

44. (New) The system according to claim 37, wherein said LESS is QR Decomposition (QRD).

45. (New) The system according to claim 40, wherein said RLS is computed by a systolic array.

46. (New) The system according to claim 37, wherein said LESS utilizes one or more of a Block Matched Filter Estimator (BMFE), a Block Zero Forcing

Estimator (BZFE), and/or a Block Minimum Mean Square Error Estimator (BMMSEE).

47. (New) The system according to claim 46, wherein one or more of said BMFE, said BZFE, and/or said BMMSEE are computed via one or both of a Cholesky decomposition and/or a QR Decomposition (QRD).

48. (New) The system according to claim 37, wherein said at least one processor constrains said LESS as CLESS by using initial BOT from complex number arithmetic to real number arithmetic, wherein said at least one processor applies two real computation, Constrained Least Square Solver, (CLESS), wherein each one produces P output streams, and wherein said at least one processor implements a corresponding number of P IBOT modules from real number arithmetic to complex number arithmetic.

49. (New) The system according to claim 37, wherein said at least one processor performs one or more of temporal, spatial, joint temporal and/or spatial channel estimation of the signal.

50. (New) The system according to claim 37, wherein said at least one processor performs one or more of temporal, spatial, joint temporal and/or spatial channel equalization.

51. (New) The system according to claim 37, wherein said at least one processor performs carrier frequency estimation.

52. (New) The system according to claim 37, wherein said system is an adaptive filter.

53. (New) The system according to claim 37, wherein said at least one processor performs one or more of channel estimation, system parameter estimation, channel equalization, recursive updating of output parameters, non-recursive updating of output parameters, and/or system identification.